

[0195] What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. An optical switch assembly comprising:
 - a fixed optical array;
 - a movable optical array;
 - a plurality of first optical fibers mounted on said fixed optical array and a plurality of second optical fibers mounted on said movable optical array; and
 - a mounting apparatus, wherein said fixed optical array is immobile relative to said mounting apparatus and said movable optical array is movable along said mounting apparatus.
2. The optical switch assembly of claim 1, wherein said mounting apparatus comprises a plurality of mounting structures.
3. The optical switch assembly of claim 2, wherein:
 - said fixed optical array includes an upper chip mated to a lower chip, said chips including grooves which mate to receive said first optical fibers and cut-in portions which create a notch between said upper and lower chips; and
 - said movable optical array includes an upper chip mated to a lower chip, said chips including grooves which mate to receive said second optical fibers and cut-in portions which create a notch between said upper and lower chips.

4. The optical switch array of claim 3, wherein a pair of fibers are positioned in said notches, said movable optical array being movable along said fibers and said fixed optical array being affixed to said fibers.

5. An optical switch assembly comprising:

a fixed optical array including at least one chip with a plurality of first and second grooves;

a movable optical array including at least one chip with a plurality of first and second grooves;

a plurality of first optical fibers mounted on said fixed optical array and a plurality of second optical fibers mounted on said movable optical array, wherein said first grooves of said fixed optical array are adapted to receive said first optical fibers and said first grooves of said movable optical array are adapted to receive said second optical fibers; and

a mounting apparatus comprising a plurality of mounting structures, said fixed optical array being immobile relative to said mounting apparatus and said movable optical array being movable along said mounting apparatus, wherein said second grooves of said fixed optical array are adapted to receive said mounting structures and said second grooves of said movable optical array are adapted to receive said mounting structures.

6. The optical switch assembly of claim 5, wherein said mounting structures comprise one or more of the group composed of rails, fibers, and spheres.
7. The optical switch assembly of claim 6, wherein said mounting apparatus comprises a substrate.
8. The optical switch assembly of claim 7, wherein said rails are integral with said substrate.
9. The optical switch assembly of claim 8, wherein said rails have a rectangular profile.
10. The optical switch assembly of claim 8, wherein said rails have a semi-circular profile.
11. The optical switch assembly of claim 7, wherein said substrate includes an opening.
12. The optical switch assembly of claim 11, wherein when said chips are mounted on said substrate, said first and second grooves are on a surface of said chips closest to said substrate.
13. The optical switch assembly of claim 7, wherein said substrate comprises a plurality of first grooves.

14. The optical switch assembly of claim 13, wherein said mounting structures comprise fibers affixed to said plurality of first grooves in said substrate.
15. The optical switch assembly of claim 13, wherein said mounting structures comprise a first plurality of spheres affixed to said first grooves in said substrate and a second plurality of movable spheres positioned within said first grooves in said substrate, said fixed optical array being mounted on said affixed spheres and said movable optical array being mounted on said movable spheres.
16. The optical switch assembly of claim 7, wherein said substrate includes a first plurality of grooves and a second plurality of grooves extending in a transverse direction to said first plurality of grooves.
17. The optical switch assembly of claim 16, further comprising first mounting structures positioned in said substrate first plurality of grooves, said fixed optical array being affixed to said first mounting structures.
18. The optical switch assembly of claim 17, further comprising second mounting structures in said substrate second plurality of grooves, said movable optical array being movable on said second mounting structures.
19. A method for making an optical switch assembly, comprising:
 positioning a plurality of first optical fibers in a first support structure and
 a plurality of second optical fibers in a second support structure;

mounting said first and second support structures on at least one
mounting apparatus; and
affixing one of said first and second support structures to said mounting
apparatus.

20. The method of claim 19, wherein said mounting comprises positioning
grooves, located on said first and second support structures, on mounting
structures located on said mounting apparatus.

21. The method of claim 20, further comprising preparing said mounting
structures, including:

locating a plurality of grooves within a base structure;
positioning a fiber within each said groove; and
affixing said fibers to said grooves.

22. The method of claim 21, wherein one of said first and second support
structures is affixed to said base structure fibers.

23. The method of claim 20, further comprising preparing said mounting
structures, including:

locating a plurality of grooves within a base structure;
positioning a first and a second plurality of spheres within said grooves;
and
affixing said first plurality of spheres to said grooves.

24. The method of claim 23, wherein one of said first and second support structures is affixed to said first plurality of spheres.

25. The method of claim 19, wherein said mounting comprises:
positioning a pair of fibers within cut-in portions of said first and second support structures; and
affixing one of said first and second support structures to said fibers.

26. The method of claim 25, wherein said first and second support structures each include upper and lower support portions, each said portion having a pair of said cut-in portions, wherein said cut-in portions of said upper support portion mate with said cut-in portions of said lower support portion to create notches for receiving said rails.

27. The method of claim 19, further comprising preparing said mounting apparatus, including:
providing a first plurality and second plurality of grooves in a base structure, said first plurality of grooves being transverse to said second plurality of grooves;
positioning a plurality of mounting structures within said base structure grooves; and
affixing one of said first and second support structures to said mounting structures in said first plurality of grooves in said base structure.

